

27th August. Second moult occurred. Length 9m. Sides mottled brown and yellow: dorsum yellow. Tubercles, from being black, have taken on the metallic-blue luster of the final larval stage; the head, likewise, has assumed the bright chestnut red of the full grown larva; in fact the general appearance is now that of the mature larva prior to pupation.

Absent from home 30th August to 23rd September, and no material change noticeable on my return. Found several larval skins and assume that at least one further moult had taken place. Length still 9m.

29th Sept.—2nd Oct, Another moult.

3rd—11 Oct. Weather cold, snow, and as much as 22 degrees of frost. The leaves of the food plant decayed and turned brown, both in the feeding bottle and in nature. Clearly hibernation must now occur.

12th Oct. Fourteen of the larvae still alive; went to earth.

My material did not re-appear in the Spring, so the satisfaction of rearing the species from egg to moth was not realized. My memoranda would however serve to show that there are at least four moults prior to hibernation; that after the second moult the general appearance is very much that of the full grown larvae, and that the pre-hibernation growth is remarkably slow and retarded—though there is the possibility of this being attributable to captivity to some degree.

I realize that, from the specialist's point of view, the above account leaves much to be desired as to specificness (and probably accuracy) of detail. It is only supposed to be the story of the early stages of the insect as seen by a collector.

## A SYNOPSIS OF THE NORTH AMERICAN SPECIES OF THE GENUS HELINA R.-D., SENS. LAT. (DIPTERA, ANTHOMYIIDAE).

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The forty species included in the present synopsis belong to several closely allied genera, *Helina*, *Hebecnema*, *Spilaria*, *Xenomysdaca*, and *Enoplopteryx*. All of the species would fall within the limits of Stein's genus *Mydaca* but they are undoubtedly a conglomerate group and it is in my opinion necessary to separate the component parts at least as subgenera though I incline to the opinion that they are really entitled to full generic rank. The distinguishing characters of the groups are dealt with in several of my recently published papers on the family and will be summarised in a generic synopsis which is now in manuscript.

### KEY TO SPECIES.

#### MALES.

1. Hypopleura with fine erect hairs usually in a more or less vertical series below middle of spiracle or near posterior margin; eyes with long hairs; prealar bristle short but distinct; scutellum with the setulose hairs continued downward on lateral margins and at times slightly invading ventral surface; basal abdominal sternite with a few hairs.... (*Spilaria*) 2.
- Hypopleura with a few long hairs on upper margin in front of spiracle; sides and ventral surface of scutellum bare; first abdominal sternite

- bare.....(Gen. n.) *marmorata* Meigen?
- Hypopleura bare; if with a few hairs below spiracle the sides and ventral surface of scutellum are bare; first abdominal sternite sometimes with a few hairs.....4
2. Hind femur with a few bristly hairs at apex on posteroventral surface, none of which are nearly as long as the diameter of femur where they are situated; eyes densely long haired, separated by a little more than width of anterior ocellus.....*multisetosa* Schnabl
- Hind femur with a number of bristles at apex on posteroventral surface, most of which are distinctly longer than diameter of femur where they are situated.....3.
3. Eyes densely long haired, separated by a little more than width of anterior ocellus; black species, more or less densely gray pruinose, but the dorsum of thorax always shining.....*lucorum* Fallen
- Eyes rather sparsely haired, separated by distinctly more than the width across posterior ocelli; black species, the entire body densely gray pruinose, the dorsum of thorax not distinctly shining.....*punctata* Stein
4. Legs entirely black.....5
- Legs partly yellowish or reddish.....13
5. Eyes separated by nearly one third of the head-width; mid tibia with two very strong anterodorsal bristles; hind tibia with one or two bristles near base on posterodorsal surface; first abdominal sternite setulose.....*latifrontata* Malloch
- Eyes separated by much less than one third of the head-width; mid tibia without anterodorsal bristles except in *nitida* and *nigrita*.....6.
6. Knobs of halteres black.....7.
- Knobs of halteres pale.....9.
7. Margins of calyptrae black; eyes with short hairs; arista with its longest hairs as long as width of third antennal segment; posteroventral surface of hind femur without strong bristles; basal abdominal sternite setulose.....*nitida* Stein
- Calyptrae yellowish, margins pale; eyes bare.....8.
8. Posteroventral surface of hind femur with a series of strong bristles; longest hairs on arista not longer than its basal diameter; basal abdominal sternite bare; prealar bristle moderately long.....*hannai* sp. n
- Posteroventral surface of hind femur almost bare; longest hairs on arista longer than width of third antennal segment; prealar bristle absent or minute; basal abdominal sternite bare....*Hebecnema vespertina* Fallen
9. Mid tibia with a small protuberance on posterior side beyond middle, which is covered with short setulae, and basad of the protuberance about ten long bristles on the same surface.....*tuberculata* Malloch
- Mid tibia without such protuberance and bristles.....9a.
- 9a. Hind femur with a series of long bristles from base to apex on anteroventral surface, the length of the bristles exceeding the diameter of femur; a few weak hairs sometimes below metathoracic spiracle; basal abdominal sternite setulose.....*nasoni* Malloch

- Hind femur with long bristles confined to apical half of anteroventral surface; basal abdominal sternite bare.....10.
- 10. Abdomen with a black dorsocentral vitta; eyes short haired, almost contiguous.....*Hebecnema umbratica* Meigen.
- Abdomen with paired black dorsal spots; eyes not nearly contiguous....11.
- 11. Thorax with three pairs of postsutural dorsocentral bristles; hind femur with antero-and posteroventral bristles; mid tibia with two weak anterodorsal bristles.....*nigrite* Malloch
- Thorax with four pairs of postsutural dorsocentral bristles; posteroventral surface of hind femur and anterodorsal surface of mid tibia without bristles .....12.
- 12. Abdomen inconspicuously spotted; wings very conspicuously browned towards base and anteriorly; hind tibia without a bristle near base on posterodorsal surface; eyes separated by less than width across posterior ocelli.....*nigricans* Stein
- Abdomen conspicuously spotted; wings hyaline; hind tibia with a setula near base on posterodorsal surface; eyes separated by at least as great a distance as width across posterior ocelli.....*duplicata* Meigen
- 13. Thorax with four pairs of postsutural dorsocentral bristles.....14.
- Thorax with three pairs of postsutural dorsocentral bristles.....24.
- 14. Femora partly or entirely black.....15.
- Femora entirely pale.....22.
- 15. Eyes with dense long hairs; abdomen ovate, with dorsal paired spots and lateral checkerings.....16.
- Eyes bare or with very short sparse hairs; abdomen not as above.....19.
- 16. Hind femur without bristles on posteroventral surface; hind tibia with long bristles on entire length of anteroventral and posterior surfaces.....*pectinata* Johannsen
- Hind femur with long slender bristles on basal half of posteroventral surface; hind tibia not as above.....17.
- 17. Thorax with one pair of long presutural acrostichal bristles; lateral margins and ventral surface of scutellum bare.....*orbitaseta* Stein
- Thorax without long presutural acrostichal bristles.....18.
- 18. Eyes separated by about the width of anterior ocellus; ventral surface of scutellum bare.....*rufitibia* Stein.
- Eyes separated by at least the width across posterior ocelli; ventral surface of scutellum with sparse erect soft hairs.....*brevis* Stein
- 19. Abdomen with a distinct black dorsocentral vitta; eyes sparsely haired, almost contiguous above; hind femur without bristles on posteroventral surface except near apex.....*Hebecnema vespertina* Fallen
- Abdomen with distinct paired spots on dorsum.....20.
- 20. Third wing-vein bristly at base; hind tibia with a very long anterodorsal median bristle, the apical dorsal one very weak.....*Enoplopteryx anceps* Zetterstedt\*
- Third wing-vein bare at base; apical dorsal bristle on hind tibia strong, nearly or quite as long as the median anterodorsal one.....21

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\* Recorded by Stein but probably erroneously.



21. Prealar bristle present but small; hind femur bare at middle on posteroventral surface; mid tibia without anterodorsal or posteroventral bristles; fifth sternite without strong bristles.....*duplicata* Meigen
- Prealar bristle absent or minute; hind femur with one or two strong, but not very long bristles at middle of posteroventral surface; mid tibia with one or two anterodorsal and posteroventral bristles; fifth abdominal sternite with a very strong bristle on each side of cleft.....*bispinosa* Malloch
22. Thorax shining fulvous, without conspicuous pruinescence; facets on upper half of eyes very conspicuously enlarged, the head flattened above; arista plumose.....*Hebecnema fulva* (Bigot)
- Thorax if fulvous with distinct pruinescence; facets of eyes but little enlarged above, the head not flattened; arista very short haired.....23.
23. Hind tibia with two or more anterodorsal bristles; hind femur with eight to ten bristles extending from middle to apex on anteroventral surface, the longest bristles distinctly longer than the diameter of femur.....*lysinoc* Walker
- Hind tibia with one anterodorsal bristle; hind femur with three or four short bristles at apex on anteroventral surface, none of which exceed in length the diameter of femur.....*uniseta* Stein.
24. Scutellum with a conspicuous black spot on each side at base.....*uliginosa* Fallen
- Scutellum without such spots.....25.
25. Abdomen with an indistinct black dorsocentral vitta; mid tibia with one or two anterodorsal bristles; fore tibia with two posterior bristles; basal abdominal sternite setulose.....*linearis* Malloch
- Abdomen with paired spots on dorsum which are sometimes indistinct; mid tibia almost invariably without anterodorsal bristles.....26.
26. Eyes separated by one third of the head-width; only the fore femora blackened; spots on dorsum of abdomen very indistinct .....*spinilamellata* Malloch
- Eyes separated by much less than one third of the head-width, or not otherwise as above.....27.
27. Posteroventral surface of hind femur with long hairlike bristles on almost its entire length or on basal half; posterodorsal surface of hind tibia with from one to three short setulae.....28.
- Posteroventral surface of hind femur bare or with a few bristles at middle or near apex; posterodorsal surface of hind tibia without setulae except in *abiens* and *spuria*.....30.
28. Hind tibia with long soft hairs on ventral surfaces....*consimilata* Malloch
- Hind tibia with a few small bristles on anteroventral and posteroventral surfaces, the ventral surface bare.....29.
29. Eyes separated by three times the width across posterior ocelli; legs black .....*fletcheri* Malloch
- Eyes separated by less than twice the width across posterior ocelli; tibiae and apices of femora reddish yellow.....*nigribasis* Malloch.

30. Hind tibiae with rather dense long bristly hairs on ventral surfaces....30a.  
 — Hind tibia without dense bristly hairs on ventral surfaces...30b.  
 30a. Hind femur with some long bristly hairs on apical half of posteroventral surface; cross-veins indistinctly infuscated.....*oregonensis* Malloch  
 — Hind femur without long bristly hairs on posteroventral surface; cross-veins very conspicuously infuscated.....*cothurnata* Rondani.  
 30b. Only the fore femora blackened; palpi yellow; prealar bristle absent; cross-veins not infuscated; hind femur bare at middle on posteroventral surface.....*abiens* Stein  
 — All femora more or less blackened; palpi largely or entirely black; prealar bristle distinct except in *spuria*.....31.  
 31. Cross-veins of wings very conspicuously infuscated; hind femur bare at middle on posteroventral surface; third vein bare at base; basal abdominal sternite setulose.....*obscurinervis* Stein  
 — Cross-veins of wings very narrowly infuscated; hind femur with a few short bristles on middle of posteroventral surface; third wing-vein at base and basal abdominal sternite bare.....*spuria* Malloch  
 — Cross-veins of wings not infuscated; hind femur with two or three short bristles at middle of posteroventral surface; third vein with a few weak setulae at base above and below; basal abdominal sternite bare.....*Xenomydaea buccata* Malloch

## FEMALES.

1. Hypopleura with some fine hairs below spiracle.....2.  
 — Hypopleura with some hairs on its upper margin in front of spiracle.....*marmorata* Meigen?  
 — Hypopleura bare.....5.  
 2. Hind tibia with three anterodorsal bristles; wing-veins 3 and 4 very decidedly divergent at apices.....*multisetosa* Schnabl  
 — Hind tibia with two anterodorsal bristles; veins 3 and 4 very little divergent at apices.....3.  
 3. Thoracic and abdominal pruinescence brownish gray; calyptrae yellowish.....*lucorum* Fallen  
 — Thoracic and abdominal pruinescence whitish gray; calyptrae white.....*punctata* Stein  
 — Thoracic and abdominal pruinescence whitish gray; calyptrae  
 4. Legs entirely black, rarely with the knees reddish.....6.  
 — Legs with at least the tibiae of one or more pairs reddish or yellowish....  
 5. Mid tibia with one or more anterodorsal bristles; hind tibia with one or two posterodorsal setulae near base.....7.  
 — Mid tibia without anterodorsal bristles; or the hind tibia has no posterodorsal setulae near base and the arista is nearly bare.....9.  
 6. Ventral surface of scutellum with soft erect hairs....*hylemyioides* Malloch  
 — Ventral surface of scutellum bare.....7.  
 7. Halteres blackish brown.....*nitida* Stein.  
 — Halteres pale yellow.....*latifrontata* Malloch  
 8. Halteres black.....9.  
 — Halteres pale.....10



9. Arista pubescent; calyptrae with black margins....*fuscmarginata* Malloch
- Arista plumose; calyptrae entirely pale.... *Hebecnema vespertina* Fallen
10. Arista plumose; prealar bristle absent or minute; mid tibia without antero-dorsal bristles.....*Hebecnema umbratica* Meigen
- Arista pubescent; prealar bristle more than half as long as the one behind it; mid tibia with one or two anterodorsal bristles. .*tuberculata* Malloch
11. Thorax with four pairs of postsutural dorsocentral bristles.....12.
- Thorax with three pairs of postsutural dorsocentral bristles
12. Ventral surface of scutellum with some soft erect hairs at apex; mid tibia with several anterodorsal bristles.....*brevis* Stein
- Ventral surface of scutellum bare.....13.
13. Mid tibia with an anterodorsal bristle; mid and hind femora in part blackened.....*duplicata* Meigen
- Mid tibia without an anterodorsal bristle; mid and hind femora not blackened .....14.
14. Thorax with a very strong pair of presutural acrostichals..*orbitaseta* Stein
- Thorax without a strong pair of presutural acrostichals....*rufitibia* Stein
15. Abdomen checkered, without distinct paired dorsal spots; palpi black....16.
- Abdomen with paired dorsal black or brown spots, if the spots are indistinct the ground colour of the abdomen and sometimes of the thorax is more or less testaceous and the palpi are entirely or largely yellow.....17.
16. Antennae entirely black.....*mimetica* Malloch
- Third antennal segment conspicuously reddish yellow at base.....*johnsoni* Malloch
17. Longest hairs on arista about as long as width of third antennal segment.....*Hebecnema fulva* Bigot
- Arista much shorter haired.....18.
18. Hind tibia with one anterodorsal bristle; abdomen black, densely gray pruinulent, with black paired dorsal spots; palpi broadly infuscated at apices.....*uniseta* Stein
- Hind tibia with two anterodorsal bristles; abdomen more or less testaceous, gray pruinulent, with poorly defined brown paired spots on dorsum; palpi entirely yellow.....*lysinoc* Walker
19. Scutellum with a conspicuous black spot on each side at base.....*uliginosa* Fallen
- Scutellum without such spots.....20.
20. Third wing-vein with a few weak setulae at base above and below.....*Xenomydaea buccata* Malloch
- Third wing-vein bare at base.....21.
21. Wings with the cross-veins very conspicuously infuscated; hind tibia without posterodorsal setulae near base.....22.
- Wings with the cross-veins not or but slightly infuscated, or the hind tibia has one or more posterodorsal setulae near base.....24.
22. Thorax entirely yellowish testaceous; head and abdomen fuscous; arista with its longest hairs distinctly shorter than width of third antennal segment.....*bicolorata* Malloch

- Thorax largely or entirely blackish.....23.
- 23. Arista with its longest hairs about equal in length to width of third antennal segment; hind femur with one or two long bristles at middle on posteroventral surface.....*obscurinervis* Stein
- Arista with its longest hairs about as long as its basal diameter; hind femur without bristles at middle on posteroventral surface.....*neopocilloptera* Malloch
- 24. Hind tibia with one setula near base on posterodorsal surface.....sp.
- Hind tibia with three or four setulae on posterodorsal surface.....25.
- 25. Only the fore femora infuscated; antennae with second segment and base of third ferruginous; longest hairs on arista longer than width of third antennal segment; fore tibia with one posterior bristle; mid tibia without an anterodorsal bristle.....*abiens* Stein
- Mid and hind femora as well as fore pair infuscated at bases; antennae entirely black; longest hairs on arista a little shorter than width of third antennal segment; fore tibia with one anterodorsal and usually two posterior bristles; mid tibia with an anterodorsal bristle.....*nigribasis* Malloch
- Only the fore femora infuscated; antennae with second segment reddish; longest hairs on arista distinctly shorter than width of third antennal segment.....*spuria* Malloch

### ***Helina hannai* sp. n.**

*Male and Female.*—Black, almost glossy. Orbits and cheeks with white pruinescence, frontal stripe opaque black; antennae and palpi black. Thorax indistinctly trivittate. Abdomen with brownish gray pruinescence, and a continuous dorsocentral black vitta. Legs black. Wings slightly fuscous, bases of veins yellow. Calyptrae bright yellow. Knobs of halteres black.

Eyes of male separated by about one tenth of the head-width; arista very pubescent; eyes almost bare. Thorax with 4 pairs of postsutural dorsocentral bristles; prealar bristle long. Abdomen subcylindrical, slightly tapered at apex; hypopygium small. Fore tibia with two or three setulae on posteroventral surface; mid tibia with two posterior bristles; hind tibia with two anterodorsal and two anteroventral bristles; hind femur with a continuous series of long bristles on anteroventral surface and some on basal half of posteroventral.

*Female.*—Frons over one third of the head-width; arista pubescent as in male.

Length, 6.5—7.5 mm.

*Type.*—St. George Island, Behring Straits, June 24, 1914. Allotype and two paratypes, same data as type; one male paratype and puparium, same locality, June 20, 1913; one male, June 10, 1914; one male and two females, June 17, 1914 (G. D. Hanna).

Named in honor of the collector.

Type in collection of United States Bureau of Biological Survey.